AMENDMENTS TO THE CLAIMS

Please cancel claims 2 and 9 without prejudice.

Please amend claims 1, 3, 8, 10, and 14, such that the status of the claims is as follows:

1. (Currently amended) A magnetic sensor comprising:

a sensor stack having a physical ~~dimension~~ width with a corresponding electrical width and a physical height with a corresponding electrical height; and

means for providing an electric field that creates a charge carrier depleted region in the sensor stack ~~to produce an electrical dimension of the sensor stack which corresponds to and is smaller than the physical dimension~~ such that at least one of (a) the electrical width is smaller than the physical width and (b) the electrical height is smaller than the physical height.

2. (Canceled)

3. (Currently amended) The magnetic sensor of claim [[2]] 1, wherein the means for providing an electric field comprises two bias electrodes disposed on opposing sides of the sensor stack such that [[an]] the electrical width of the sensor stack is a function of a bias voltage applied to the two bias electrodes.

4. (Original) The magnetic sensor of claim 3, wherein the two bias electrodes are biased with negative DC bias voltages.

5. (Original) The magnetic sensor of claim 3, wherein the two bias electrodes are biased with positive DC bias voltages.

6. (Original) The magnetic sensor of claim 3, wherein the two bias electrodes are biased with an AC bias voltage.

7. (Original) The magnetic sensor of claim 3, wherein the two bias electrodes are biased with bias voltages of opposite polarity.

8. (Currently amended) The magnetic sensor of claim [[2]] 1, wherein the means for providing an electric field comprises a bias electrode disposed on a side of the sensor stack such that [[an]] the electrical width of the sensor stack is a function of a voltage of the bias electrode.

9. (Canceled)

10. (Currently amended) The magnetic sensor of claim [[9]] 1, wherein the means for providing an electric field comprises a bias electrode ~~disposed~~ positioned ~~on a side of the sensor stack opposite an air bearing surface of the sensor stack~~ such that [[an]] the electrical ~~stripe~~ height of the sensor stack is a function of a bias voltage applied to the bias electrode.

11. (Previously presented) A magnetoresistive read head comprising:

a magnetoresistive stack; and

a first bias electrode positioned with respect to the magnetoresistive stack such that a read width of the magnetoresistive stack is a function of a bias voltage applied to the first bias electrode.

12. (Original) The magnetoresistive read head of claim 11, wherein the first bias electrode is disposed on a side of the magnetoresistive stack.

13. (Original) The magnetoresistive read head of claim 12, further comprising:

a second bias electrode disposed on a side of the magnetoresistive stack opposite the first bias electrode, the first and second bias electrodes each providing a voltage.

14. (Currently amended) The magnetoresistive read head of claim 13, further comprising

a third bias electrode ~~disposed~~ positioned ~~on a side of the magnetoresistive stack opposite an air bearing surface of the magnetoresistive stack~~ such that an electrical stripe height of the magnetoresistive stack is a function of a bias voltage applied to the third bias[[ed]] electrode.

15. (Original) The magnetoresistive read head of claim 12, further comprising:

a second bias electrode disposed on a side of the magnetoresistive stack opposite the first bias electrode, the second bias electrode having a bias voltage of opposite polarity to a bias voltage applied to the first bias electrode.

16. (Previously presented) The magnetoresistive read head of claim 11, wherein the first bias electrode is made of a material selected from the group consisting of Rh, Ti, CoPt, CoCrPt, Cr, NiPd, NiCu, Au, Pt, Pd, V, Ta, and alloys thereof.

17. (Withdrawn) The magnetoresistive read head of claim 11, wherein the magnetoresistive stack is a tunneling magnetoresistive stack including two sensing layers with a tunnel barrier positioned therebetween.

18. (Withdrawn) The magnetoresistive read head of claim 17, wherein the tunnel barrier is made of a semiconductive material selected from the group consisting of GaP, AlP, ZnSe, AlAs, CdS, CdSe, AlSb, ZnTe, CdTe, and alloys thereof.

19. (Withdrawn) The magnetoresistive read head of claim 17, wherein the tunnel barrier is a dielectric barrier made of an oxide compound having a negative heat of formation.

20. (Withdrawn) The magnetoresistive read head of claim 17, further comprising:

one or more semiconductive current channeling layers positioned within the magnetoresistive stack

21. (Withdrawn) The magnetoresistive read head of claim 20, wherein the one or more semiconductive current channeling layers are made of a semiconductive material selected from the group consisting of GaP, AlP, ZnSe, AlAs, CdS, CdSe, AlSb, ZnTe, CdTe, and alloys thereof.

22. (Withdrawn) The magnetoresistive read head of claim 17, wherein the sensing layers are made of a magnetic semiconductive material.

23. (Withdrawn) The magnetoresistive read head of claim 17, wherein the sensing layers are made of a half-metallic ferromagnetic material selected from the group consisting of CrO2, CoTiO, ZnCoO, a Heusler alloy, Fe3O4, a Mn oxide compound with a perovskite structure, and a Mn nitride compound.

24. (Withdrawn) The magnetoresistive read head of claim 11, wherein the magnetoresistive stack is a giant magnetoresistive stack including two sensing layers with a conducting spacer positioned therebetween.

25-26. (Canceled)